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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,513	10/24/2003	Nitin Muppalaneni	5693P026	2215

48102 7590 08/10/2006

NETWORK APPLIANCE/BLAKELY
12400 WILSHIRE BLVD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

KO, DANIEL BOKMIN

ART UNIT	PAPER NUMBER
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2189

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/693,513	MUPPALANENI ET AL.	
	Examiner	Art Unit	
	Daniel B. Ko	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-7,10-17,19 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-7,10-17,19 and 21-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/23/06 & 7/17/06</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This action is responsive to the Amendment filed on 5/23/2006. Any objections and rejections from the prior correspondence not restated in this communication is/are withdrawn.

Information Disclosure Statement

The information disclosure statements (IDSs) submitted on 5/23/2006 and 7/17/2006 were considered by the examiner.

Drawings

The substitute drawings filed 5/23/2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 1, 5-7, 11-12, 13, 15-17, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galipeau et al. (US Patent 6,308,283 B1), hereinafter simply Galipeau, in view of Achiwa et al. (US Patent Application 2004/0230756 A1), hereinafter simply Achiwa

Regarding claims 1, 17, and 24, Galipeau teaches a method of operating a destination storage server to mirror a primary volume maintained by a source storage server, the method comprising:

receiving, at the destination storage server, a plurality of log entries from the source storage server, the plurality of log entries representing write requests received by the source storage server (Fig. 2, WorkStation 2; column 3, lines 51-53; Galipeau discloses three workstations in local system);

writing the received log entries to a file maintained by the destination storage server (column 3, lines 26-33; column 6, lines 58-64);

receiving, at the destination storage server, data from the source storage server during a synchronization phase of a consistency point, the consistency point being one of a plurality of regularly occurring consistency points, each characterized by the saving of data specified by write requests in a set of non-volatile storage devices managed by a RAID layer in the source storage server, wherein said data received at the destination storage server from the source storage server during the

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synchronization phase of the consistency point (column 7, lines 56-61; Galipeau discloses the send process reads Store and Forward Logs every tenth of a second);

using the data to received at the destination update a mirror volume at the mirror site via a storage access layer in the destination storage server (column 3, lines 26-39; column 9, lines 4-15); and

using log entries from the file to update the mirror volume (column 3, lines 37-39; column 9, lines 43-64).

Galipeau fails to teach volume block number updates during the synchronization. Achiwa teaches volume block number updates during the synchronization (paragraph 116). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Galipeau with Achiwa. The motivation for doing so would have been an excellent coherency of volume image (paragraph 321).

Regarding claims 5, 11, 15, and 22, Galipeau teaches a method, wherein said using log entries from the file to update the mirror volume is done at the consistency point in conjunction with said using the data to update the mirror volume (column 7, lines 56-61; Galipeau discloses the send process reads Store and Forward Logs every tenth of a second).

Regarding claims 6, 12, 16, and 23, Galipeau teaches a method, wherein said using log entries from the file to update the mirror volume is done in response to a failure that renders the primary volume inaccessible (column 1, lines 55-58).

Regarding claims 7, and 13, Galipeau and Achiwa teach a method of mirroring data, the method comprising:

at a source storage server, receiving a plurality of write requests from a set of clients (Fig. 2, WorkStation 2; column 3, lines 51-53; Galipeau discloses three workstations in local system);

creating log entries for the write requests in the source storage server (column 3, lines 21-25);

transmitting the log entries to a destination storage server at a mirror site (column 3, lines 26-33; column 6, lines 58-64);

writing the log entries to a file corresponding to the source storage server in the destination storage server (column 3, lines 26-33); and

at a consistency point of a plurality of regularly occurring consistency points, (column 7, lines 56-61; Galipeau discloses the send process reads Store and Forward Logs every tenth of a second),

causing a primary volume implemented in a set of non-volatile storage devices maintained by a RAID layer in the source storage server to be updated based on the write requests (column 6, lines 1-57), and

during a synchronization phase of the consistency point, causing a mirror volume implemented in a set of non-volatile storage devices maintained by a RAID layer the destination storage server at the mirror site to be updated to reflect the updated primary volume (column 8, lines 10-20), by

transmitting consistency point data from the source storage server to the destination storage server (column 3, lines 26-33; column 6, lines 58-64), the consistency point data including volume block number updates from the source storage server (See Achiwa, paragraph 116),

receiving the consistency point data at the destination storage server (column 3, lines 26-33),

updating the mirror volume through the RAID layer in the destination storage server based on the received consistency point data (column 9, lines 4-15), and

using log entries from the file to update the mirror volume (column 3, lines 37-39; column 9, lines 43-64).

2. Claims 4, 10, 14, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galipeau in view of Teloh et al. (US Patent Application 2003/0014433 A1), hereinafter simply Teloh.

Regarding claim 14, Galipeau teaches a method of operating a destination storage server to mirror a primary volume maintained by a source storage server (See claims 1 and 7 rejections).

Galipeau fails to teach a method, wherein the receiving data from the source storage server comprises transmitting the consistency point data from the source file server to the destination file server using TCP/IP. Teloh teaches a method, wherein the receiving data from the source storage server comprises transmitting the consistency point data from the source file server to the destination file server using TCP/IP (page 1,

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paragraph 14; page 2, paragraph 21; page 4, paragraph 44; Teloh discloses transmission between the originating location and the remote location using the TCP/IP). At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Galipeau with Teloh. The motivation for doing so would be enabling remote data mirroring amongst multiple remote storage devices across data transmission paths having various transmission capabilities (page 1, paragraph 13). Teloh states that the remote data mirroring is performed using the TCP/IP protocol suites, which allows share a transmission path with other IP traffic (page 3, paragraph 42). Therefore, it would have been obvious to combine Galipeau with Teloh for the benefit of flexible transmission capabilities to implement the remote data mirroring.

Regarding claims 4, 10, and 21, Teloh teaches a method, wherein said receiving the data from the source storage server comprises receiving the data via TCP/IP (page 1, paragraph 14; page 2, paragraph 21).

Regarding claim 19, Teloh teaches a storage server, wherein the network administration unit is at the same logical level as the file system layer (page 1, paragraph 6; page 2, paragraph 17).

Response to Arguments

Applicant's arguments with respect to claims 1, 4-7, 10-17, 19, and 21-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

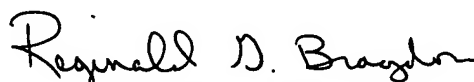
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald G. Bragdon can be reached on 571-272-4204. The fax phone number for the organization where this application or proceeding is assigned is 703-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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